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The Files

February 1956

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Trip Report, 25 January 1956.

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1. This trip to was made for the purpose of discussing the redesign of the field equipment and the application of on-line enciphering equipment, such as the equipment now being produced in small quantities by NSA. Present for the discussions on these programs were:

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2. The redesign of the field unit was the first item to be discussed. The Laboratory Report, which made recommendations for improvements to be incorporated in any redesign, was used as a guide for this discussion. This report pointed out specific mechanical and electrical details which contributed to the malfunctioning of the original coder. Since the coder will be entirely redesigned, only those features which might be common to the new and old coder were discussed. In the new coder a common reading and writing head will be used, thus eliminating the problem of head design prevalent in the old unit. For writing, a commutator with positive gearing to the sprocket tape drive will provide accurate sync and baud spacing. For playback, the sprocket drive will be governed. The take-up reel drive will be simply that sufficient to dispose of the tape without an appreciable effect on the governed sprocket drive speed. A complete redesign of the power supplies was also a part of the contractor's proposal. In this redesign the new receiver power supply will definitely be transistorized. According to information the contractor has received from there is a very good possibility that the high voltage power supply may be transistorized. This, however, may be vibrator or chopper type of supply. The contractor suggested that he would like to make the battery case detachable from the main case. We agreed that this would not only be advantageous for transporting purposes but for battery recharge as well. The contractor advised that in his proposal was the complete redesign of the receiver, except for the front end. In this redesign the mechanical instabilities of the IF section would be eliminated. The high frequency and stepping oscillator circuitry would be redesigned in order to provide greater reliability. The contractor expects also to place new emphasis upon the antenna design, since the type of antenna used on the original equipment was a war surplus antenna and is probably not now available for the new units.

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3. In response to specific complaints outlined in the laboratory evaluation, the contractor asked that:

a. several of the poor U.S. manufactured 5894/PX9903 tubes be sent to [redacted] for further investigation. 50X1

b. we provide him with further details as to the failure to the field unit receiver of Paragraph 2.8.

c. we provide him with a corrected instruction book described in Paragraph 2.9.

d. we provide the frequencies desired for the new units.

e. we advise how many loading coil forms we need for our present application.

4. The contractor also agreed that the antenna loading tuning would be adjusted for less optimistic ground conditions as outlined in Paragraph 2.7 of the report. In reply to certain of our recommendations, the following comments were made:

a. [redacted] took exception to Paragraph 4.1 which recommended that printed-through eyelets be used to improve the reliability of the printed circuitry. He doubted that we would obtain improved reliability using this technique. He did agree, however, that eyelet reliability should be improved and gave us the attached report indicating work they have done in this direction. 50X1

b. The Contractor agreed to give consideration to a means for providing a "heat sink" to permit bench testing of the field units as outlined in Paragraph 4.1.2.

c. The problem of improper switch detent action or alignment as outlined in Paragraph 4.2.1 is caused chiefly by the flexible chassis arrangement in the present unit. This problem is presently being investigated and some solution should be reached.

5. The following points of general interest were discussed:

a. [redacted] was asked to suggest test equipment for the field unit. They stated that they probably will provide some minimal test equipment, however, anything comprehensive will require additional funding. 50X1

b. From the point of prototype approval by the Laboratory, the contractor stated that timing would not permit evaluation

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of the initial units in Washington. The contractor would appreciate our sending an engineer to his plant, however, to help in shaking down the original unit.

c. The contractor's proposal does not include spare parts for the units ordered. We requested that he provide us with a parts peculiar list, so that we may order the necessary spares.

d. The contractor further agreed to investigate the permanent recording of the recognition signal on the tape.

6. After the Laboratory report of the field unit had been thoroughly discussed and the general scope of the contractor's proposal had been reviewed, we transfered our attention to [redacted] Communi- 50X1
cations System. Considerable discussion on the development of an amplique to the [redacted] equipment to permit utilization of the [redacted] 50X1
[redacted] followed. From the discussion of this system, it would appear that the 50X1
most expeditious handling of traffic could be accomplished if the [redacted] 50X1
[redacted] were placed in the signal centers at each end of the 50X1
[redacted] system. This has the disadvantages of complicating slightly 50X1
the present [redacted] system, as well as requiring approximately six or seven 50X1
racks in the signal center. (See attached sketches A and B for the block diagram of this arrangement.) Such a system, however, has the great advantages of allowing a message [redacted] from signal center to 50X1
signal center without additional handling and of permitting communications along the entire route at the maximum transmission rate of 1600 words per minute. It is believed that standard telephone lines would be satisfactory between the signal centers and the transmitting and receiving stations. Program quality lines, however, would provide an improvement.

7. [redacted] 50X1
asked how long it would take to put the present [redacted] 50X1
unit into good operating condition, incorporating most of the 50X1
recommended changes resulting from the [redacted] field tests. [redacted] said 50X1
that the unit could be cleaned up in approximately three months, provided the unit is received [redacted] at an early date. Points of redesign already 50X1
recognized are the exciter tuner (feedback problems need analysis), the IF gain tracking, the [redacted] oscillator, and the tape transport mechanism. 50X1
In response to [redacted] question as to whether [redacted] could go into 50X1
production on the [redacted] equipment, [redacted] replied that additional units on 50X1
a model shop basis could be produced in from nine to twelve months from receipt of the contract. Simultaneous refurbishment of the existing unit plus the model shop production of two one-way units could probably be accomplished in approximately seven months.

8. [redacted] indicated that [redacted] has an internal research project 50X1
on the analysis of multipath over various ranges. He suggested that if we had any intention of making further [redacted] tests that they would be very 50X1

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desirous of monitoring our transmissions so that they might gain additional multipath information. [redacted] was advised that if we planned any tests of this nature we would see whether it would be acceptable to permit them to monitor the transmissions. 50X1

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cc: Monthly Report (2)
R&D Subject File
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28 November 1955

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1. In accordance with our request during our recent visit called at about 1500 to submit a verbal proposal for the redesign and clean-up of the present field unit.

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2. For specific redesign of the coder, redesign of the power supply, and partial redesign of the receiver, plus the general clean-up of the remainder of the circuitry, quotes for the first two units; the balance in quantities of 5-20, per unit.

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3. pointed out that this work will constitute practically all of the redesign for the coder and power supply, originally considered under proposal, and about one-half of the receiver redesign required, so that from this point, development should be about 1/3 to 1/2 completed.

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OC-E/R&D-EP/WNH:mmb (30 November 1955)

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R&D SUBJECT FILE
R&D Subject File
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